

Remarks

Claims 37 to 45 are pending. Claim 37 has been amended.

In the Drawings

The Office Action objected to the drawings and contained a request for drawings showing “first and second surfaces having an undercut resulting in a positive rake angle.” Applicant submits that the previous Amendment submitted by Applicant on December 2, 2002, fulfills this requirement and that no further submission is required. Figure 14 and its supporting description show the undercut 65 resulting in a positive rake angle. Further support is found at page 16, line 23 through page 17, line 10. Reconsideration and withdrawal of this objection is respectfully requested.

§ 103 Rejections

Claims 37-45 stand rejected under 35 USC § 103(a) as being unpatentable over Sloane (U.S. 2,585,971).

In the Office Action, claims 37-45 were rejected as being unpatentable over the Sloane reference. It was stated that Sloane disclosed a device with almost every structural limitation of the claimed invention but lacked first and second faces having an undercut. The Examiner took official notice that providing an undercut on the side of a gear is old and well known in the art and provides various well-known benefits. It was concluded that it would have been obvious to one having ordinary skill in the art to provide an undercut on the sides of the gear of Sloane for the well-known benefits including those described above.

Claims 39, 40, 43, and 44 were also rejected over Sloane, which was said to lack explicit disclosure of specific differences in included angles. However, the Examiner took official notice that providing a plurality of teeth that include angles that differ by at least 3 degrees and at least 10 degrees is old and well known in the art for various benefits such as providing the desired speed changing influence. The Examiner further stated that such a modification would be mere discovery of the optimum or workable ranges within the general conditions of the prior art by routine experimentation. Therefore, the Examiner concluded it would have been obvious to one having ordinary skill in the art to provide teeth having different configurations with the claimed angle differences for the well-known benefits including those described.

As a preliminary matter, Applicant submits that the Sloane reference is not a proper prior art reference for the claimed invention because it is not analogous art. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). Sloane is not a proper prior art reference because it is not in the field of endeavor nor is it pertinent to the particular problem that the invention of the present application addresses.

The Sloane reference is directed at gears having particular properties. Applicant's present invention is directed to a knurling wheel. A knurling wheel differs in the principal of operation from a gear in that a gear does not have cutting teeth. If force is generated on the side of gear

teeth, the teeth can deform and subject the gear to forces that would inhibit or destroy its operation. A knurling wheel is used to remove material from the surface of an object to be knurled using cutting teeth. The teeth at the outer peripheral surface are subjected to forces from the cutting action they impart upon the material of the surface to be worked upon. One of ordinary skill in the art would not look to gears to solve the problems that are addressed by the invention of the present application.

Claim 37 has been amended to require a plurality of cutting teeth on a said outer peripheral surface of a cylindrical body. This amendment was made to clarify that the teeth on the knurling wheel are used to remove material from an object to be knurled. Assuming *arguendo* that the Sloane reference is a proper prior art reference, the Sloane reference still does not disclose a knurling wheel that includes a plurality of cutting teeth on a said outer peripheral surface, as is required by claim 37. The Sloane reference does not disclose or suggest a plurality of cutting teeth on an outer peripheral surface of a cylindrical body because using the teeth on the gear of Sloane to cut would destroy its operation; and, in any event, there is no teaching or motivation to use the gear teeth of Sloane to cut. For at least these reasons, claim 37 is not obvious in light of the Sloane reference.

Claims 38-45 depend from and further limit independent claim 37. For at least the same reasons that claim 37 is not obvious in light of the Sloane reference, claims 38-45 are not obvious in light of the Sloane reference. The rejection of claims 37-45 under 35 USC § 103(a) as being unpatentable over Sloane (U.S. 2,585,971) has been overcome and should be withdrawn.

Conclusion


The rejection of claims 37-45 under 35 USC § 103(a) as being unpatentable over Sloane (U.S. 2,585,971) has been overcome and should be withdrawn. Claims 38-45 each add additional features to claim 37. Claim 37 is patentable for the reasons given above. Thus, claims 38-45 are likewise patentable.

In summary, the rejection of claims 37-45 under 35 USC § 103(a) as being unpatentable over Sloane (U.S. 2,585,971) has been overcome and should be withdrawn.

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested and allowance of claims 37-45, as amended, is solicited.

Respectfully submitted,

June 25. 2003
Date

By: 
Rick L. Franzen, Reg. No.: 51,702
Telephone No.: 651/736-6432
FAX 736-6133

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833